

ED 331 026

CS 010 544

AUTHOR Lundberg, Ingvar
TITLE A Decade of Reading Research in Sweden. Svenska unescoradets skriftserie. Nr. 1/1991.
INSTITUTION Ministry of Education and Cultural Affairs, Stockholm (Sweden).
SPONS AGENCY United Nations Educational, Scientific, and Cultural Organization, Paris (France).
PUB DATE 91
NOTE 31p.; An earlier version of this paper was presented at the World Congress on Reading (13th, Stockholm, Sweden, July 3-6, 1990).
AVAILABLE FROM Swedish National Commission for UNESCO, Ministry of Education and Cultural Affairs, S-103 33 Stockholm, Sweden (no charge).
PUB TYPE Information Analyses (070) -- Speeches/Conference Papers (150)

EDRS PRICE MF01 Plus Postage. PC Not Available from EDRS.
DESCRIPTORS *Beginning Reading; Elementary Secondary Education; Foreign Countries; Literature Reviews; *Reading Comprehension; *Reading Difficulties; *Reading Research
IDENTIFIERS *Emergent Literacy; *Sweden

ABSTRACT

Covering studies from psychology, education, linguistics, and literature, this review of reading research in Sweden published in the 1980s includes sections on early reading development or emergent literacy, reading disabilities, and reading comprehension. Material in the review was selected using the following criteria: (1) only research published in English, French, or German was included; (2) the research was published in referred journals or as monographs or book chapters reviewed by experts; (3) the research was published after 1980; and (4) only original research was included, and empirical studies were given high priority. Sixty-two references are attached. (RS)

* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *

ED331020

Svenska unescorådets skriftserie. Nr 1/1991.
FNs internationella läskunnighetsår 1990



A DECADE OF READING RESEARCH IN SWEDEN

"PERMISSION TO REPRODUCE THIS
MATERIAL IN MICROFICHE ONLY
HAS BEEN GRANTED BY

Ingvar Lundberg

TO THE EDUCATIONAL RESOURCES
INFORMATION CENTER (ERIC)."

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION
CENTER (ERIC)

by

☒ This document has been reproduced as
received from the person or organization
originating it.

☐ Minor changes have been made to improve
reproduction quality.

• Points of view or opinions stated in this docu-
ment do not necessarily represent official
OERI position or policy.

Ingvar Lundberg

BEST COPY AVAILABLE

Stockholm 1991

Svenska unesörådets skriftserie. Nr 1/1991.
FNs internationella läskunnighetsår 1990



**A DECADE OF READING RESEARCH IN
SWEDEN**

by

Ingvar Lundberg

Stockholm 1991

PREFACE

The UN has proclaimed 1990 International Literacy Year.

Combatting illiteracy and promoting literacy has long been one of the principal aims of Swedish development co-operation policy. In a national perspective too, efforts in school and adult education for the further improvement of reading and writing skills are looked on as highly essential.

A Committee was appointed within the Swedish Ministry of Education and Cultural Affairs to act as national co-ordinating body of the International Literacy Year. One of the tasks of the Committee was to codify Swedish research findings and other experiences in the literacy sector. Professor Ingvar Lundberg, one of the Committee-members, is one of the most outstanding Swedish researchers in this field.

This report is based on ten years of internationally recognized research at different universities in Sweden. The bulk of the findings were introduced at the Thirteenth World Congress on Reading held in Stockholm July 2-7, 1990, by the International Reading Association

Birgitta Ulvhammar
Chairman

Swedish National Committee for the UN International Literacy Year 1990

Karl-Göran Biörsmark
Vice-chairman



The symbol of the international literacy year

A DECADE OF READING RESEARCH IN SWEDEN

Ingvar Lundberg
Department of Psychology
University of Umeå
Umeå, Sweden

INTRODUCTION

Written language is a relatively new development in the history of mankind. Alphabets are cultural achievements not older than three or four thousand years, whereas spoken language is probably as old as the human species. A system which allows the user (a reader or a writer) to communicate with others from whom he is removed in space and time has certainly had the most pervasive and profound consequences for the living conditions of man. The efficiency of writing for storing information is obvious. By making marks on a surface, one can transform an idea or a thought into something physical that transcends time and space. Thus, written language is spatial, visible, and durable, whereas speech is evanescent and temporal.

No wonder that mastery of such a remarkable system has become a highly valued skill that is a prerequisite to success in our society. It is also a skill that is pretty much taken for granted by those who can do it. However, it is in fact an extremely complex skill which requires explicit instruction and a considerable amount of practice for its full development. To analyze reading would indeed be to describe "very many of the most intricate workings of the human mind" (Huey, 1908, p. 6). Skilled readers must be familiar with 30-40 000 words and be able to recognize them within a fraction of a second even when typefonts are different and when the meaning of a word differs in different contexts. Very powerful computers, despite tremendous memory capacity, cannot do what skilled readers can do.

In the past ten to fifteen years, researchers have substantially advanced the frontiers of our knowledge about the reading skill. Significant new discoveries have been produced especially in cognitive psychology. The reading process has become an attractive challenge for cognitive psychologists and linguists who have felt the need of demonstrating the relevance and applicability of their disciplines.

As in many other fields, reading research has been heavily dominated by U.S.A., Canada and England. The generality of the insights gained from this impressive work might, however, be hampered by the fixation to a single language, a specific orthography, specific school traditions, and specific cultural patterns. However, a more balanced situation is now developing. Over the last couple of years, the activity level in reading research has remarkably increased in some European countries, most notably in the Netherlands, Belgium, Germany, Italy, Spain, and the Scandinavian countries. The present review will present the Swedish research scene as it has evolved over the eighties. With the exception of studies by Edfeldt (1959; 197+) and by Malmquist (1958, 1970) almost nothing has really been reported to the international audience before 1980.

As a context for the review of Swedish reading research, some general background information about the Swedish school system and Swedish orthography will be presented.

BACKGROUND

By a long historic tradition, reading literacy has been a highly valued skill in Sweden, even in preindustrial times. Long before a compulsory school system was established in 1842 a majority of the adult population was literate in the sense that they could pass annual Church Examinations where oral reading performance as well as comprehension of religious concepts were assessed by the parish priest (see Johansson, 1987). Furuland (1989) has described the further development of

literacy in Sweden. He pointed out the critical role of electric light in the process of literacy socialization of the Swedish people over the past century. He now observes how electronic media threaten the dream of wide spread and high quality literacy.

The Swedish school system

Compulsory education starts when the child is 7 years old and includes 9 years of schooling. Almost 100 % of the schools are public, and teaching is regulated by a master plan common to all schools in the country. Teachers are trained in state colleges with uniform admission policies and uniform standards of quality. The remarkable homogeneity of the school system is further promoted by the lack of social stratification in most Swedish municipalities. With the exception of a few metropolitan districts, residential areas are mixed with people from all kinds of social strata. Tax and income policies have brought about considerable economic equality. Thus, on the whole, the variation among schools is small in comparison with most countries as far as teaching standard and socio-economic background of the pupils (and thus achievement) are concerned.

In special education the integration work has advanced considerably over the past decade. Special schools for handicapped or special classes are extremely rare now, most pupils with special needs being integrated in regular classrooms. There is also a general trend of trying to break the traditional isolation of individual teachers and establish teams of teachers where special educators are included.

According to a firmly established tradition in Sweden, children should not be subjected to any formal reading instruction before the school start, neither in preschool institutions nor at home.

In the last preschool year more than 90 % of all children are enrolled in kindergarten or day care centers for at least 3 hours per day. By tradition the emphasis in Swedish child care service is on social, emotional, and esthetic development rather than on intellectual preparation for school work. Thus, a majority of Swedish children enter school by the age of 7 without any reading ability. However, there seems to be a tendency, as reported by first-grade teachers, that an increasing number of children has been subjected to informal literacy socialisation at home and are thus able to decode simple words and sentences.

Methods of the first reading instruction

Methods of reading instruction are fairly uniform in the first grades. All existing basal readers system in Sweden are designed to keep some balance between analytic and synthetic methods from the beginning. Listening, speaking, reading and writing are integrated from the start, which is in contrast to many other countries (e.g. the U.S.A.) where writing is typically introduced later in the program. In Sweden, writing is supposed to support the teaching of reading and facilitate the task of breaking the alphabetic code. Phonemic segmentation and sound blending is emphasized early by a majority of teachers. During the last decade some version of a language experience approach has caught the attention of many Swedish teachers in the elementary grades. Mostly it is used as a supplement to traditional, basal oriented methods, and the phonics elements are retained as an important part of the new approach.

Up till now, teachers in the elementary grades typically follow a class during the first three years after which they start anew with a beginner's class. Thus, they tend to develop a higher degree of expertise on beginning teaching than colleagues in countries where students are followed over a much longer period (e.g. Denmark).

Orthography

The phonics emphasis in Swedish teaching of reading is probably a reflection of the rather regular orthography. Although the grapheme-phoneme correspondences are quite consistent, at least in comparison with English, there are some significant exceptions causing problems, especially in spelling and to some extent also in reading. Some sound segments can be represented in the orthography in a great number of ways. Take for example the / / sound which can be spelled in the following ways: *stj*, *sj*, *skj*, *sk*, *sch*, *ch*, *sh*, *g*, *si*, or *ti*. The /j/ sound is spelled as *j*, *g*, *gj*, *hj*, *lj*, or *dj*. Vowels such as /o/ are quite randomly spelled *o* or *å*, and / / is spelled *ä* or *e*. The morpho-phonemic character of the orthography can be illustrated by *hög* (high) and *högt* (highly) where *gt* is pronounced *kt* but spelled according to the morphemic relationship.

Especially hard hurdles are the principles for doubling consonants, which also is one of the main sources of misspellings. The rules are very complicated and include many exceptions. The normal case is that consonants are doubled to indicate a preceding short vowel. In unstressed syllables, however, short vowels do not need double consonants. A number of other exceptions are governed by morphological rules. Like many other German languages, Swedish is also characterized by heavy clusters of consonants in initial as well as in final position, e.g. *strand*, *skälmskt*, or in middle position in compound words such as *falsktskrikande*. Phonotactic reductions and assimilations are common in normal pronunciation, e.g. *Lundberg* is often pronounced *Lumberg*.

Research review

Any reviewer faces selection problems. In the present case these problems were handled by the application of the following explicit criteria:

- (1) Only research published in a language available to an international scientific community will be included (English, German, French).
- (2) The research should have been published in refereed journals or as monographs or book chapters reviewed by experts.
- (3) The research should not have been published earlier than 1980.
- (4) Only original research will be included, and empirical studies will have high priority.

Reading as a complex skill requires multidisciplinary approaches for its exploration. Thus, the review includes studies from psychology, education, linguistics, and literature.

The material has been organized in the following way: First, a section on early reading development or emergent literacy will be presented. The second major section will be concerned with reading disabilities. Reading comprehension in a broad sense will be treated in the third section. Finally, specific aspects of reading not covered by the general themes will be included in the fourth section.

Early reading development

The acquisition of reading skill does not begin with formal reading instruction in school. Throughout the preschool years, most children in Western societies are subjected to a great deal of informal literacy socialization. Although a majority of children enter school as nonreaders in the traditional sense, they often display surprisingly well developed concepts of the nature and the function of written language. A skill component, however, is also involved in reading literacy, which does not easily seem to develop spontaneously in the natural ecology of a child, but which, in many cases, seems to require explicit

teaching and extensive practice for its development. Thus, mere exposure to print in the environment is not sufficient for reading development. Hundreds of millions of illiterate adults with no school experience reside in urban environments polluted with commercial print and road signs without making much spontaneous progress.

Lundberg (1987c) proposed that reading acquisition emerges from two separate but related ontogenetic roots, one being critical to word decoding and the other related to the comprehension aspect of reading. The second developmental strand involves book-handling skills, print awareness, and experience of story tellings and readings. The factor behind word recognition or decoding of the alphabetic script, however, has rather to do with phonological awareness, i.e. the ability to attend to the sound structure of language.

"One of the great successes of modern psychology is the discovery of a strong relationship between phonological awareness and learning to read" (Bryant & Goswami, 1987). Swedish researchers have contributed significantly to clarifying the causal nature of the relationship taking advantage of the fact that we have a comparatively late school start. This implies that we can find perfectly normal children by the age of 7 who still cannot read a word and only know a few letters by name. Thus, we can investigate factors related to early reading in a less confounded way as compared to most other countries. By combining longitudinal and experimental methods important advances of the field have also been made.

Lundberg (1982) reported a study where reading disabled and normal readers were compared as to the ability to segment spoken words into segments like syllables and phonemes. The difference was dramatic in the first three grades but decreased to a much lower but still significant level in later grades. This kind of finding, although very robust and reproducible, does not tell us much of the causal mechanism.

In Lundberg, Olofsson & Wall (1980) the ability to attend to the formal aspects of language (e.g. rhyming, phoneme segmentation or synthesis) was assessed in preschool for some 200 children. They were followed over the three first grades in school where their reading and spelling progress was assessed. On the basis of preschool data on phonological skills it was possible to predict the level of reading and spelling skill three years later with high accuracy, even when general intelligence and other factors were kept under control. However suggestive, the data were still basically correlational in nature and did not permit strong causal interpretations.

Now, a critical question was whether phonemic awareness was a skill that could be trained in kindergarten outside the context of formal reading acquisition. The answer was clearly affirmative in a study by Olofsson & Lundberg (1983). The design was quasiexperimental with pre- and posttest and included three experimental groups and two control groups. The training period was 6-8 weeks with daily 15-min sessions.

In a later study (Olofsson & Lundberg, 1985) the long term effect on reading and spelling in school was assessed. Due to ceiling effects no clear cut results could be reported, although some indications of a positive effect on spelling was obtained.

Torneus (1984) came closer to a solution of the chicken and egg problem. She did a LISREL-analysis of the data reported in Lundberg (1985) and got support for a model specifying a causal relationship from phonological awareness to spelling and reading. Additional evidence was obtained from an experimental training study on a different set of students.

A large scale study in cooperation with Danish school psychologists finally settled the case (Lundberg, Frost & Petersen, 1988). More than 400 children participated in an extensive program for stimulating phonological awareness in preschool. The positive effects on reading and spelling persisted until grade 4 when the last assessment was made. This

unambiguous finding has theoretical as well as practical implications (Lundberg, 1987 a,b; Lundberg & Höien, 1989,1990).

To develop a functional orthographic lexicon for fast and automatic word recognition, the child must grasp the alphabetic principle and attend to the constituent structure of words. Without phonological insight, there is no way to use the alphabetic system productively in reading and spelling. This seems to be the conclusion to draw from the research evidence reported by the Umeå-group.

Closely related to the issue of linguistic awareness is the assumed dichotomy between oral and literate culture. Non-literate children (preschoolers) generally do not understand puns or more complex riddles, which seem to require flexible attention shifts between content and linguistic form. A commonly held view is then that literacy is a prerequisite for becoming aware of linguistic forms. Aronsson (1988) challenged this view as well as theories that emphasize the importance of literacy for the child's general cognitive development.

According to Aronsson (1988) language becomes visible when there are problems in connection with communication. Such problems often arise for a bilingual child who notices errors of interference. Aronsson (1981) found that the grammatical awareness was more developed among bilingual preschoolers than among monolingual children. Thus, literacy is only one of several practices with a bearing on language awareness according to Aronsson. Her analysis (Aronsson, 1984) of the Amharic language in Ethiopia revealed how language structure might facilitate indirect and complex oral practices with impact on language visibility.

The fundamental impact of written language on cognitive development has been emphasized by Olson (1986). The permanence of written language leads to a different treatment of language, where a distinction is made between intentional meaning ("what was meant") and sentence meaning ("what was

actually said"). Nonliterate children should then have difficulties in realizing that a sentence can have a different meaning from the intended meaning. Learning to read and write implies that one makes explicit the distinction between form and content. Working with the alphabetic system, handling linguistic forms on paper should facilitate the discovery of the language system, facilitate that there are different ways of expressing linguistically one and the same state of affairs.

This was the starting point of a series of investigations reported by Hedelin and Hjelmquist (Hedelin, 1988; Hjelmquist & Hedelin, 1989; Hedelin, 1990). In ingenious play situations they studied preschooler's ability to make the distinction between what is said and what is meant. On the whole, however, the relationship between this ability and reading and writing was weak or absent.

More qualitative studies of early reading acquisition have been reported by Söderbergh (1977). She studied, very carefully, single cases who acquired reading skill long before school start (already by the age of three) and described in much detail the course of learning. Detailed, qualitative studies of early reading acquisition have also been reported by Liberg (1986, 1988). Dahlgren & Olsson (1985) published a study on the child's concepts about reading and functions of reading before school start and after some period in grade 1.

Among studies of early reading acquisition should also be mentioned a joint Scandinavian effort (reported in English by Høien & Lundberg, 1989). Some 50 children from 10 different Scandinavian environments (rural, urban) have been followed closely from preschool to grade 4. The approach has been case oriented, comparative, ethnographic and ecological, where the children's reading development has been related to factors in home environment (social and cultural capital), community resources, classroom processes, language etc. A stage model of early reading acquisition has been guiding the assessments and observations. Exceptional slow development has been observed

in a few cases. The explanation has not been found in environmental factors.

A longitudinal study of 700 children was reported by Lundberg (1985). After about 7 months in grade 1 a comprehensive survey was done of cognitive functions, reading, spelling, school attitudes, self-concept, sociometric status, and teacher ratings of language development, motor skills, social development and emotional adjustment. Part of this broad assessment program was repeated in later grades.

Despite a most homogeneous school environment and home background, considerable variation among children in reading and writing was found already in the first school year. The variation was explained in terms of a broad spectrum of factors. By applying various multivariate techniques, like AID-analysis and path-analysis, the conclusion was reached that language development had the most crucial role in accounting for individual differences in basic skills in reading and spelling, the contribution of other variables, such as motor skill, social and emotional adjustment, school attitudes, self concept, class size etc. being small or insignificant.

The level of basic skills in reading and spelling in grade 1 was highly predictive of later development in these fields. The extreme group of children, who either showed unexpected rapid development or unexpected slow development of reading were compared along a large number of dimensions. Also here language, and especially language understanding, was the most critical determinant. Neither pedagogical environment (classroom) nor home background could explain the rate difference.

Reading disability

Sweden has provided at least two classical contributions to the research literature on dyslexia, one from medicine (Hallgren, 1950) and from education (Malmquist, 1959). During the 1980's a renewed interest in the field has emerged. Important inspiration has come from Norway (Gjessing, Höien) and Denmark (Elbro). A notable Swedish contribution to the international scientific community in dyslexia research is the establishment of "Academia Rodinensis pro Remediatione" (Per Uddén, Curt von Euler, Ragnar Granit). The prestigious academy was founded in 1982. Among its 100 members from many countries seven Nobel prize winners can be found. Several important international conferences, work-shops and symposia have been organized and sponsored by the academy and resulted in publications (e.g. von Euler, Lundberg, & Lennerstrand, 1989; Whyte, 1989).

Why do some students have difficulties in learning how to read? Among the candidates proposed as causal factors in reading disability or developmental dyslexia are visual problems, faulty eye movements, crossed laterality, sequential problems, emotional disturbances, deprived home backgrounds, poor teaching etc. Although many of these factors obviously contribute to reading difficulties, a more fruitful approach in the search for causal factors might be to start with an analysis of the specific cognitive and linguistic demands raised by the alphabetic script. Such task analysis has been the point of departure for many Swedish studies of dyslexia during the past decade.

There seems now to be a fairly general agreement among dyslexia researchers~ that processing failures at the word level is a key factor in reading disability. Nonautomatic, slow, effortful, and dysfluent word recognition is a characteristic symptom of most dyslexics. However, relatively little empirical evidence has been presented concerning the underlying factors. One would suspect that many dyslexic children find it difficult

to extract the abstract and elusive phonemic units from the stream of spoken language and map these units onto the grapheme units of written language.

Lundberg (1982) demonstrated a strong relationship between reading disability and lack of phonological awareness. However, the correlational nature of the data did not permit any causal interpretation. It might well have been the case that the poor phonological awareness among the dyslexics was the consequence of limited exposure to print. A stronger case for a causal interpretation would be a demonstration of poor phonological awareness (as compared to normals) among dyslexic children even before they started to read in school. Lundberg (1989) reported a retrospective study of 13 dyslexic children, none of them showing any sign of phonemic awareness in the beginning of the last preschool year. After 8 months of extensive practice with metalinguistic tasks, three of the children came close to the average level of phonemic awareness for the whole trained population of normal children, whereas 10 children were resistant to the training program and entered school without segmentation ability. Because language comprehension, vocabulary, and nonverbal intelligence (Raven) all were in the normal range for the dyslexic children, it seems as if we have found a cognitive-linguistic deficit that is very specific to the reading task, not involving other domains in the cognitive system.

Lundberg & Höien (1989) reported the development of phonological awareness, word recognition skill, and spelling for 35 dyslexic children as compared to a normal group of 395 children. On all three dimensions there was a large difference between the groups. Over the first three school years the gap tended to increase, possibly indicating the operation of a negative Matthew effect (Taube, 1988).

Taube (1988) analysed the relationship between self concept and reading skill. LISREL-analyses supported those models suggesting a reciprocal causality. However, the influence from

performance to self concept was stronger than the influence in the opposite direction. The influence from self concept was stronger on reading comprehension than on decoding skills including spelling. As a group, the dyslexic children identified in grade 1 did not catch up in reading and spelling during the whole school period of 9 years. Besides language factors, attention and strategic behavior seemed to be critical factors distinguishing disabled students from normally achieving ones. And the learning disabled showed persistently lower self concept.

On the basis of the evidence presented so far, we can conclude that the dyslexics as a group have poor access to the phonological segments of words. The poor self concept observed could not be interpreted as a causal factor of primary importance. It might well be the case that the lack of phonological skills only is characteristic of young dyslexics, whereas older dyslexics might have overcome such problems and instead suffer from lack of higher-order textual skills.

A study of older dyslexics was reported by Lundberg & Höien (1990). Out of a population of 1250 15-year-old students 19 clear cases were selected by an elaborated procedure. Equally sized age-level matched and reading-level matched comparison groups were also selected. The assessment program included speed and accuracy of pseudo-word reading, lexical decision tasks, phoneme synthesis, and reversal of syllables, all tasks assumed to be related to phonological processes.

The dyslexic students were significantly inferior to the normal comparison groups on all phonological variables. The results indicated that the basic problems for older dyslexics were the same as for the younger ones. The critical weakness is not general but specifically related to the phonological system.

The final piece of evidence of phonological problems as a key symptom of developmental dyslexia was obtained in an MRI-study where phonological problems could be related to abnormal

asymmetry of plana temporale in the brain hemispheres (Larsen, Höien, Lundberg, & Ødegaard, 1990).

Not surprisingly, reading disabilities seem to run in families. Among the 19 dyslexics reported in Lundberg & Höien (1990), reading problems were observed among close relatives in 16 cases. For the control group the corresponding number was 3 (Höien, Lundberg, Larsen & Tønnesen, 1989).

Lundberg & Nilsson (1986) utilized the unique Swedish church examination records to study the inheritance of reading disability. They were able to follow a large number of families over several generations from 1750 and on. The incidence of reading problems was clearly higher in families starting with an affected individual than in comparison families. Tracing ancestors of dyslexic individuals living today further confirmed the family nature of the disability. However, the genetic mechanism for transferring dyslexia over successive generations is still unknown, although modern linkage methods might help to solve the issue.

Recently, Swedish researchers have considered the implications of the new conception of dyslexia for developing remedial methods. Olofsson (1990) has developed a computer-based program, where the reader reads a self-selected text on the screen. As soon as he/she encounters a difficult word, the mouse is used to point at this word which results in feedback from a speech synthesizer producing a spoken version of the word and, at the same time, a highlight of the critical word in reversed video. The speech support can also be given in syllable segments. The principles underlying this system are congruent with the core symptom of dyslexia discussed above as well as to current concepts of metacognition. Evaluation of the system has so far yielded encouraging results.

Speech synthesis has also been used in a remedial program developed by Dahl (1990) with more direct focus on phonological awareness.

People with visual impairment often have serious reading difficulties, although for reasons different from dyslexia. Visually impaired persons' reading of daily newspaper text with speech synthesis has been investigated by Hjelmquist, Jansson, & Torell (1987; 1990) and by Drottz & Hjelmquist (1986). The results indicated that visually handicapped persons can benefit very much from the support system provided by speech synthesis. The new "reading" mode was also compared to braille reading. The subjects reported that braille reading tended to give more direct contact with the text (all subjects were good braille readers). However, more text was actually read and read at a higher speed with speech synthesis.

Reading comprehension

Recent research has emphasized that reading comprehension is basically a constructive process, and that meaning derived from the text is as dependent on the reader as it is on the text. Thus, research on reading comprehension is an extremely difficult task. Only few Swedish researchers have been bold enough to make an attempt.

Traditionally, reading comprehension has been studied as a product after a reading session and assessed by asking questions about the passage or requesting recall or a summary of the content. More recently, the ongoing process of reading has attracted many cognitively oriented researchers. Studying reading on line, however, requires new methods. Bromley, Jarvella & Lundberg (1985) have developed a computer based text-window technique which permits us to follow the ongoing reading process in some detail. Visual-graphic factors, linguistic factors in the text, working memory, anaphoric resolutions, error monitoring, eye-voice span, oral reading errors are all examples of factors investigated so far with the text-window system (Jarvella & Lundberg, 1987, 1989; Jarvella,

Lundberg, & Kalliokoski, 1988; Jarvella, Lundberg & Bromley, 1989).

Waern (1980; 1988) has applied the think-aloud method to study different text processing tasks. Prior knowledge was found to be used not only for comprehension but also for idea processing and criticism. The think-aloud method was found to be useful in clarifying evaluation and monitoring processes in reading. The relationship between metacognition and reading comprehension has been studied by Persson (1989) who interviewed skilled and less skilled readers by the age of 12 and 15. The awareness of reading processes and strategies for comprehension was low among the younger and the less skilled readers.

Oral reading speed, free recall and summarization of narrative stories presented on videotex were studied as a function of reading skill, text structure and physical factors were studied by Backman, Lundberg, Nilsson, & Ohlsson (1984). A total of 144 subjects (13-14 years old) participated in the experiment, half of them being rated as poor readers and half as good readers. Good readers outperformed poor readers on all dependent variables. Important propositions in the text structure were better recalled and were more often included in summaries than less important parts of the texts, especially if they were signalled by a different color. Reading comprehension as an intricate interplay between various physical, structural and skill factors was highlighted in this elaborated experiment.

Linköping has been the place for a research project on interpretation and comprehension of literary texts. It started in 1982 under the leadership of Gunnar Hansson (Hansson, 1989, 1990). Recently it has been gradually transformed into a project on esthetic socialization in preschool with Cai Svensson a main coordinator. The first part of the project involved studies on how children's ability to interpret literature develops over the school years. The dimension "figurative-literal" has been particularly focussed. The interpretation ability has been found

to be influenced by a rich symbol environment in the home background. Children from homes where literary and biblical texts were read and talked about produced more symbolic interpretations of poems with symbolic meanings than did children from homes without such habits (Svensson, 1985, 1987). In another study Svensson (1989) found that the typographic arrangement affected the reader's expectation of figurative and symbolic meanings in the text, and that this sensitivity increased with age.

Over the last years the communication between ordinary people and official bodies has been a matter of great concern in Sweden. Various measures to decrease the language gap have also been taken. In particular, attempts have been made to increase the comprehensibility of law texts. Gunnarsson (1984,1985) presented a theory of functional comprehensibility of legislative texts. She identified some of the critical factors influencing the way people understand a typical law text. A key assumption was that different purposes of reading causes variation in comprehension level. Correspondingly, properties of texts could be described at different levels. Thus, for example, when the reading purpose is action oriented, superficial text levels play a minor role. Gunnarsson obtained fairly strong empirical support for her theory.

Sweden and the surrounding world

By a long tradition Sweden has a special responsibility of supporting educational projects in the third world. In this context, Lind (1988) studied national literacy campaigns in Mozambique, a country where 93 % of the population was estimated to be illiterate. She found that political priority and strong national commitment were of crucial importance for success, whereas teaching quality seemed to play a less critical role. However, in later campaigns where more illiterate people were enrolled, a number of pedagogical and organizational shortcomings were revealed. One conclusion to be drawn from Lind's important study is that reading acquisition for most adults is not an easy task. "It is important to refute the false

idea that adults learn literacy easily* as Lind expressed it. She also pointed out the risk for people to relapse into illiteracy due to lack of adequate post-literacy activities. Lind & Johnston (1990) presented a comprehensive review of approaches and strategies that have been applied in the Third World to spread literacy on a large scale among adults.

Sweden's international orientation is also reflected in the participation in IEA's comparative project on Reading Literacy in 35 different countries among which many developing countries are represented. The final data collection of this huge investigation will take place in the beginning of 1991. Various aspects of reading skill and reading activities will be related to economic and cultural resources, school organisation, teaching strategies and home factors. Our conception of reading literacy will probably be much richer after this study. New knowledge with policy implication will also be generated. Sweden plays a significant role in this project by being represented in the Steering Committee as well as in the Standing Committee of the whole IEA-organization.

CONCLUDING COMMEN

The review presented here has by no means given a complete picture of Swedish reading research. Many valuable activities were excluded by the selection criteria set up. Nevertheless, the trend is obvious. An increasing number of Swedish researchers in various academic fields have found reading and literacy challenging and worthy domains to explore. No doubt, this is a healthy and promising sign for the coming decade.

Our ultimate concern, of course, is to bring about an urgent and necessary improvement of current educational practices. Although the Swedish school system meets high international standards, the future demands on the level of reading literacy in the population are expected to be far higher than today. Only by systematic and theoretically based research within many disciplines will there be a basis for rational actions. So far,

however, the practical consequences of reading research have been quite modest. One reason for the embarrassing gap between theory and practice might be related to the researchers' emphasis on the "hardware" of written language acquisition at the expense of the "software" of learning strategies. Only if reading researchers shift their emphasis to the development of theories and models of the software of reading will basic research bring light to practical education. Promising tendencies in that direction can be detected in the present review. Over the next decade, reading research will certainly be an increasingly important field of inquiry in Sweden as well as in the rest of the world.

REFERENCES

- Aronsson, K. (1981). The bilingual preschooler as grammarian. *Psychological Research Bulletin*, 21, 10-11.
- Aronsson, K. (1988). Language practices and the visibility of language. Reflections on the great divide in the light of Ethiopian oral tradition. In R. Säljö (Ed.), *The written world. Studies in literate thought and action*. Berlin: Springer-Verlag.
- Backman, J., Lundberg, I., Nilsson, L-G., & Ohlsson, K. (1984). Reading skill and the processing of text structure. *Scandinavian Journal of Educational Research*, 29, 113-128.
- Bromley, H.J., Jarvella, R.J. & Lundberg, I. (1985). From Lisp Machine to language lab. *Behavior Research Methods, Instruments, & Computers*, 17, 399-402.
- Bryant, P. & Goswami, U. (1987). Beyond grapheme-phoneme correspondence. *Cahiers de Psychologie Cognitive*, 7, 439-443.

Dahl, I. & Galyas, K. (1987). Experiences with the use of computer progra with speech output in teaching and writing. In J. Laver & M.A. Jack (Eds.), **European Conference on Speech Technology**, 2, 422-425.

Dahlgren, G. & Olsson, L.-E. (1986). The child's conception of reading. Paper presented at the American Educational Research Association Annual Meeting April 16-20 1986, San Francisco.

Drott, B.-M. & Hjelmquist, E. (1986). Blind people reading a daily news-paper - Braille and speech synthesis. In E. Hjelmquist & L.-G. Nilsson (Eds.), **Communication and handicap**. (Pp. 127-141). Amsterdam: North-Holland.

Edfeldt, Å.W. (1959). **Silent speech and silent reading**. Stockholm: Almqvist & Wiksell

von Euler, C., Lundberg, I., & Lennerstrand, G. (Eds.), (1989). **Brain and reading**. New York: MacMillan.

Furuland, L. (1989). Literacy in Sweden: Two essays. **The Nordic Roundtable Papers**, 3, 7-39. (The Center for Nordic Studies, University of Minnesota)

Gunnarsson, B.-L. (1984). Functional comprehensibility of legislative texts: Experiments with a Swedish act of parliament. **Text**, 4, 71-105.

Gunnarsson, B.-L. (1986). Gebraucherbezogene Analyse der schwedischen Gesetzgebung. In T. Öhlinger (Her.), **Recht und Sprache**. Wien: Manzsche

Hallgren, B. (1950). Specific dyslexia (congenital word-blindness): A clinical and genetic study. **Acta Psychiatrica & Neurologica, Supplement**, 65, 1-287.

Hansson, G. (1985). Verbal scales in research on response to literature. In C. R. Cooper (Eds.), **Researching response to literature and the teaching of literature: Points of departure**. Norwood, N.J.: Ablex (Pp. 212-232).

Hansson, G. (1989). How to recognize an "interpretative community" when you see one. **Empirical Studies of the Arts**, 7, 163-173.

Hansson, G. (1990). Reading and understanding literature. Report Series 4.5 from the Center for the Learning and Teaching of Literature. University at Albany.

Hedelin, L. & Hjelmquist, E. (1989). Children's referential communication in game situation. In J Verschuern (Ed.), **Pragmatics at issue**. Amsterdam: John Benjamins.

Hedelin, L. & Hjelmquist, E. (1989). Literacy and the say/mean distinction among preschool children. In P. Boscolo (Ed.), **Writing. Trends in European research**. Padova: UPSEL EDITORE

Hjelmquist, E., Jansson, B. & Torell, G. (1987). Psychological aspects of blind people's reading of radio-distributed daily newspapers. In B. Knave & P.-G. Widebäck (Eds.), **Work with display units 86**. Amsterdam: North-Holland. (Pp. 187-202).

Hjelmquist, E., Jansson, B. & Torell, G. (1988). Computer-oriented technology for blind readers. **Journal of Visual Impairment and Blindness**, **84**, 210- 215.

Höien, T. & Lurberg, I. (1988). Stages of word recognition in early reading development. **Scandinavian Journal of Educational Research**, **32**, 163-182.

Höien, T. & Lundberg, I. (1989). A strategy for assessing problems in word recognition among dyslexics. **Scandinavian Journal of Educational Research**, **33**, 185-201.

Höien, T., Lundberg, I., Tønnesen, F. E. & Larsen, J. P. (1989). Profiles of reading related skills in dyslexic families. **Reading and Writing. An interdisciplinary journal**, **1**, 381-391.

Jarvella, R.J. & Lundberg, I. (1987). Visual constraints in reading: evidence from non-ocular behaviour. **Scandinavian Journal of Psychology**, **28**, 93-103.

Jarvella, R.J. & Lundberg, I. (1989). Vincoli percettivi versus vincoli linguistici nella lettura. **Giornale Italiano di Psicologia**.

Jarvella, R.J., Lundberg, I. & Bromley, H.J. (1989). How immediate is language understanding? Investigating reading in real time. **Reading and Writing**, **1**, 103-122.

Jarvella, R.J., Lundberg, I. & Kalliokoski, L. (1988). Awareness of ill-formedness in text as a function of presentation mode and age. In Ö. Dahl & K. Fraurud (Eds.), **Text comprehension in man and machine**. Stockholm: Institute of Linguistics, University of Stockholm.

Johansson, E. (1987). Literacy campaigns in Sweden. In R.J. Aronov & H.Graff (Eds.), **National literacy campaigns. Historical and comparative perspectives**. New York: Plenum Press (Pp. 65-98).

Larsen, J.P., Höien, T., Lundberg, I. & Ødegaard, H. (1990). MRI evaluation of the size and symmetry of planum temporale in adolescents with developmental dyslexia. **Brain and Language** (in press).

Liberg, C. (1987a). Learning to read and write, the first steps: A critical review of the scientific framing of the questions. **RUUL 16**, Department of Linguistics, Uppsala university.

Liberg, C. (1987b). The first steps toward becoming a grammarian: Children's questions and parents' answers. **Papers from the tenth Scandinavian conference on linguistics**. Bergen: Department of Linguistics and Phonetics.

Lind, A. (1988). **Adult literacy lessons and promises: Mozambican literacy campaigns 1978-1982**. Stockholm: IIE/Akademiftryck.

Lind, A. & Johnston, A. (1990). **Adult literacy in the third world. A review of objectives and strategies**. Stockholm: SIDA.

Lundberg, I. (1982). Linguistic awareness related to dyslexia. In Y. Zotterman (Ed.), **Dyslexia. Neuronal, cognitive and linguistic aspects**. Oxford: Pergamon Press.

Lundberg, I. (1985). Longitudinal studies of reading and reading difficulties in Sweden. In G.E. MacKinnon & T.G. Waller (Eds.), **Reading research. Advances in theory and practice**. New York: Academic Press.

Lundberg, I. (1987a). Are letters necessary for the development of phonological awareness? **Cahiers de Psychologie Cognitive**, 7, 472-475.

Lundberg, I. (1987b). Phonological awareness facilitates reading and spelling acquisition. In W. Ellis (Ed.), **Intimacy with language**. Baltimore, Md.: Orton Dyslexia Society.

Lundberg, I. (1987c). Two dimensions of decontextualization in reading acquisition. **RUUL**, 16, 1-24.

Lundberg, I. (1988). Preschool prevention of reading failure: Does training in phonological awareness work? In R.L. Masland & M.W. Masland (Eds.), **Pre-school prevention of reading failure**. (pp. 163-176), Parkton, Md.: York Press.

Lundberg, I. (1989). Phonological awareness and dyslexia. In C. von Euler, I. Lundberg & G. Lennerstrand (Eds.), **Brain and reading**. New York: Stockton Press.

Lundberg, I., Frost, J., & Petersen, O.-P. (1988). Effects of an extensive program for stimulating phonological awareness in preschool children. **Reading Research Quarterly**, XXIII, 263-284.

Lundberg, I. & Höien, T. (1989). Phonemic deficits - a core symptom of developmental dyslexia? **Irish Journal of Psychology**, 10, 579-592.

Lundberg, I. & Höien, T. (1990a). Patterns of information processing skills and word recognition strategies in developmental dyslexia. **Scandinavian Journal of Educational Research**, 34, 231-240.

Lundberg, I. & Höien, T. (1990b). Initial enabling knowledge and skills in reading acquisition: Print awareness and phonological segmentation. In D.J. Sawyer & B.J. Fox (Eds.), **Phonological awareness in reading: The evolution of current perspectives**. New York: Springer-Verlag.

Lundberg, I. & Leong, C. K. (1986). Compensation in reading disabilities. In E. Hjelmquist & L.-G. Nilsson (Eds.), **Communication and handicap**. (Pp. 171-190). Amsterdam: North-Holland.

Lundberg, I., & Nilsson, L.-G. (1986). What church examination records can tell us about the inheritance of reading disability. **Annals of Dyslexia**, XXXVI, 217-236.

Lundberg, I., Olofsson, Å., & Wall, S. (1980). Reading and spelling skills in the first school years predicted from phonemic awareness skills in kindergarten. **Scandinavian Journal of Psychology**, 21, 159-173.

Malmquist, E. (1958). **Factors related to reading disabilities in the first grade of elementary school**. Stockholm: Almqvist & Wiksell.

Malmquist, E. (1981). Reading disabilities in Swedish children. In L. Tarnapol & M. Tarnapol (Eds.), **Comparative reading and learning difficulties**. Toronto

Olofsson, Å. & Lundberg, I. (1983). Can phonemic awareness be trained in kindergarten? **Scandinavian Journal of Psychology**, 24, 35-44.

Olofsson, Å. & Lundberg, I. (1985). Evaluation of long-term effects of phonemic awareness training in kindergarten: Illustrations of some methodological questions in evaluation research. **Scandinavian Journal of Psychology**, 26, 21-34.

Persson, U.-B. (1989). "When I read a story I make little pictures in my head." About pupils' awareness of text structure and strategy use in reading. Paper presented at the 6th European Conference on Reading in Berlin 31 July- 3 Aug 1989.

Svensson, C. (1985). **The construction of poetic meaning: A cultural-developmental study of symbolic and non-symbolic strategies in the interpretation of contemporary poetry**. Lund: Liber.

Svensson, C. (1987). The construction of poetic meaning. A developmental study of symbolic and non-symbolic strategies in the interpretation of contemporary poetry. **Poetics**, 15, 471- 503.

Svensson, C. (1989). Poetic set: The effects of typographic arrangement on the immediate responses to poetry - a developmental study.

Spiel: Siegener Periodicum zur Internationalen Empirischen Literaturwissenschaft, 8, 77- 106.

Söderbergh, R. (1977). **Reading in early childhood: A linguistic study of a preschool child's gradual acquisition of reading ability.** Washington, D.C.: Georgetown University Press.

Taube, K. (1988). **Reading acquisition and self-concept.** Umeå: University of Umeå.

Torneus, M. (1984). Phonological awareness and reading: A chicken and egg problem? **Journal of Educational Psychology**, 76, 1346-1358.

Waern, Y. (1980). Thinking aloud during reading. A descriptive model and its application. **Scandinavian Journal of Psychology**, 21, 123-132.

Waern, Y. (1988). Thoughts on text in context: Applying the think-aloud method to text processing. **Text. An Interdisciplinary Journal for the study of discourse**, 8, 327-350.

Waern, Y. & Rollenhagen, C. (1983). Reading text from visual display units (VDUs). **International Journal of Man-Machine Studies**, 18, 441-465.

Skriftserien har utgivits sedan 1979. Förfrågningar om tidigare nummer kan göras på svenska unescorådet, utbildningsdepartementet, 103 33 Stockholm, tel 08 - 763 1954, 1950. Skrifterna erhålles gratis.

Nr 1/1985

Konvention om erkännande av studier, diplom och examina avseende högre utbildning i stater som tillhör Europa-regionen inom Unesco.

Nr 1/1986

Rapport från Unescos tjugotredje generalkonferens den 8 oktober - 9 november 1985 avgiven av den svenska delegationen.

Nr 2/1986

Unescos naturvetenskapliga program

Nr 3/1986

Nordisk rapport från Unescos 124:e styrelsemöte

Nr 4/1986

UNESCO - verksamhet och organisation

Nr 1/1987

Censur och självcensur - en Unescostudie av Lars Furhoff

Nr 2/1987

Svenska unescorådets verksamhet 1983 - 1986

Nr 3/1987

Vad gör Unesco?

Nr 1/1988

Transnational Cultural Flows and National Cultures

Nr 2/1988

ASPRO - Rapport från några internationella skolprojekt

Nr 3/1988

Konvention mot diskriminering inom undervisningen

Nr 4/1988

Rapport från Unescos tjugofjärde generalkonferens den 20 oktober - 20 november 1988 avgiven av den svenska delegationen

Nr 1/1991

FNs internationella läskunnighetsår 1990: "A decade of reading research in Sweden", Ingvar Lundberg